

Thomas, Carmen and Robert Anthony. "Environmental Contaminants in Great Blue Herons (*Ardea herodias*) from the Lower Columbia and Willamette Rivers, Oregon and Washington, USA." *Environmental Toxicology and Chemistry*. 18 (1999): 2804-2816. (Reviewed by Niko Hoskins)

This was a study done in 1994 and 1995 to test the viability of using great blue herons as indicator species for various contaminants in the Columbia and Willamette Rivers, including dichlorodiphenylethylene (DDE), polychlorinated diphenyls (PCBs) and tetrachlorodibenzo- *p* -dioxins (TCDD). Molalla State Park and Ross Island along the Willamette were chosen as test sites along with three sites along the Columbia and a site in Puget Sound as a reference. The sites were chosen based on colony size, proximity to pulp and paper mills and accessibility. Three hypotheses were tested. First, that environmental contaminants are elevated in great blue herons from the lower Columbia and Willamette Rivers. Second, concentrations of TCDD in heron eggs are related to the distance of the colony from the nearest chlorine-bleaching pulp and paper mill. Third, concentrations of certain contaminants such as DDE, PCBs and TCDD are adversely affecting heron reproductive success.

The conclusion of the study was that contaminants were found at high levels in blue herons but there was no direct correlation to location of paper and pulp mills. There wasn't a widespread and direct correlation between levels of contaminants and reproductive success either but the authors speculated that further testing might show one due to isolated instances of birth defects. In all, the report suggests that Great Blue Herons can be used as an indicator species for contaminant levels along the Columbia and Willamette Rivers.

Critique

Deriving as much as I can from the plain English of the abstract, intro and conclusion of this report I can say that the study was planned in a thorough manner and carried out very well. There was a point where certain procedures were changed as more capable facilities became available, but the improved capabilities ended up not affecting the outcome. While the content of this report is valuable, namely in realizing great blue herons as a suitable indicator species and recognizing some of the limitations of that usage, it seems like this report would be far more useful with a follow-up. The third of the three hypotheses, whether contaminant levels adversely affected the reproductive process of great blue herons, seems as if it should have been the most important of the three, yet it is left unsuitably answered according to the authors. Addressing the long-term viability of the species along the river should be the most important issue, followed by how useful the species can be in indicating contaminants.

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